2011 Energy Report
City of Santa Barbara

July 26, 2012

Jim Dewey – Facilities and Energy Manager

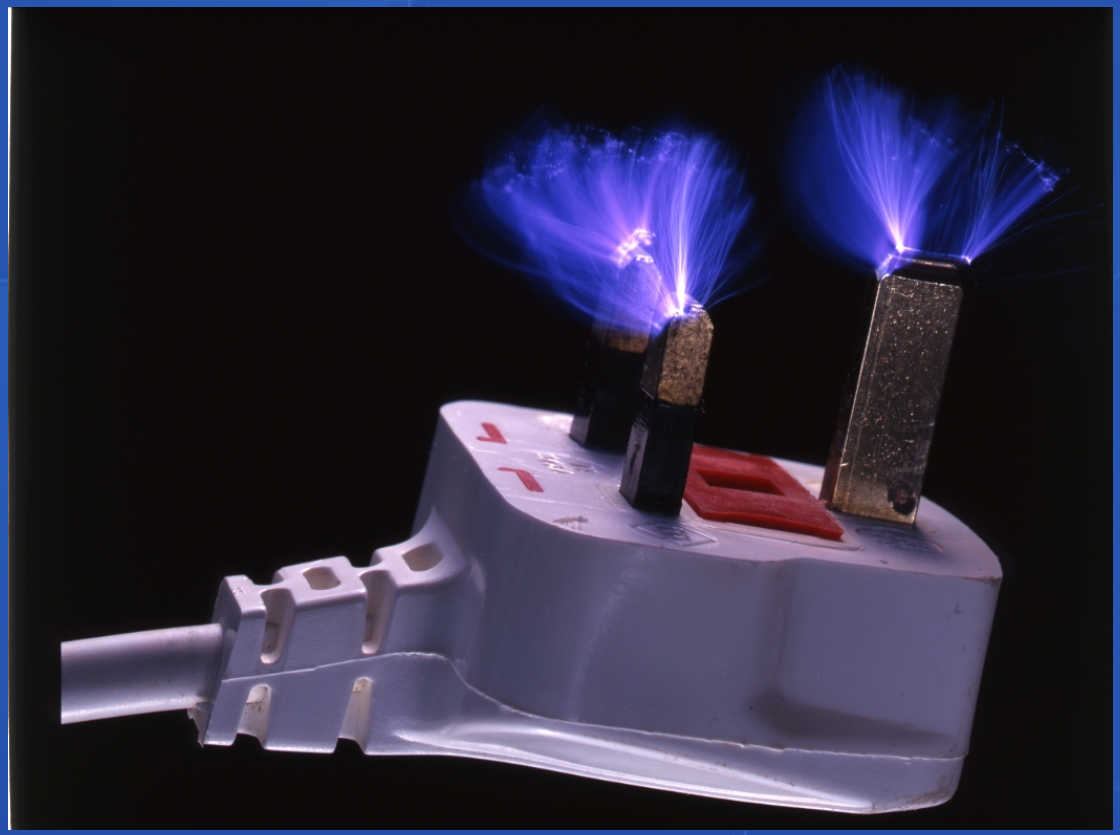
2011 Energy Report

2011 was a year of project development for the City's Energy Team. The team continued to develop the Fats, Oils and Grease (FOG) and Cogeneration (Cogen) projects at the El Estero Wastewater Treatment Plant, which began planning in 2010. Both projects are expected to be completed in fiscal year 2013 and will allow the City to offset significant energy costs by converting brown grease (FOG) into methane and subsequently, methane into energy (Cogen). This project will also significantly reduce vehicle emissions by reducing the number of truck trips to dispose of this material in Kern County.

The Energy Team managed the application for and award of eight electric vehicle charging stations. The City was awarded the stations by Coulomb Technologies and the Department of Energy as part of an effort the make California electric vehicle ready. The station installations will be completed in July 2012.

Lastly, the Team is working to procure an Enterprise Energy Management Information System. The City was awarded $360,000 by Southern California Edison, under the direction of the Public Utilities Commission to implement an utility management system as part of the California Long-Term Energy Efficiency Strategic Plan. This system will allow us to gather critical data to help direct and reinforce our energy program.

Electricity



Electrical Supply

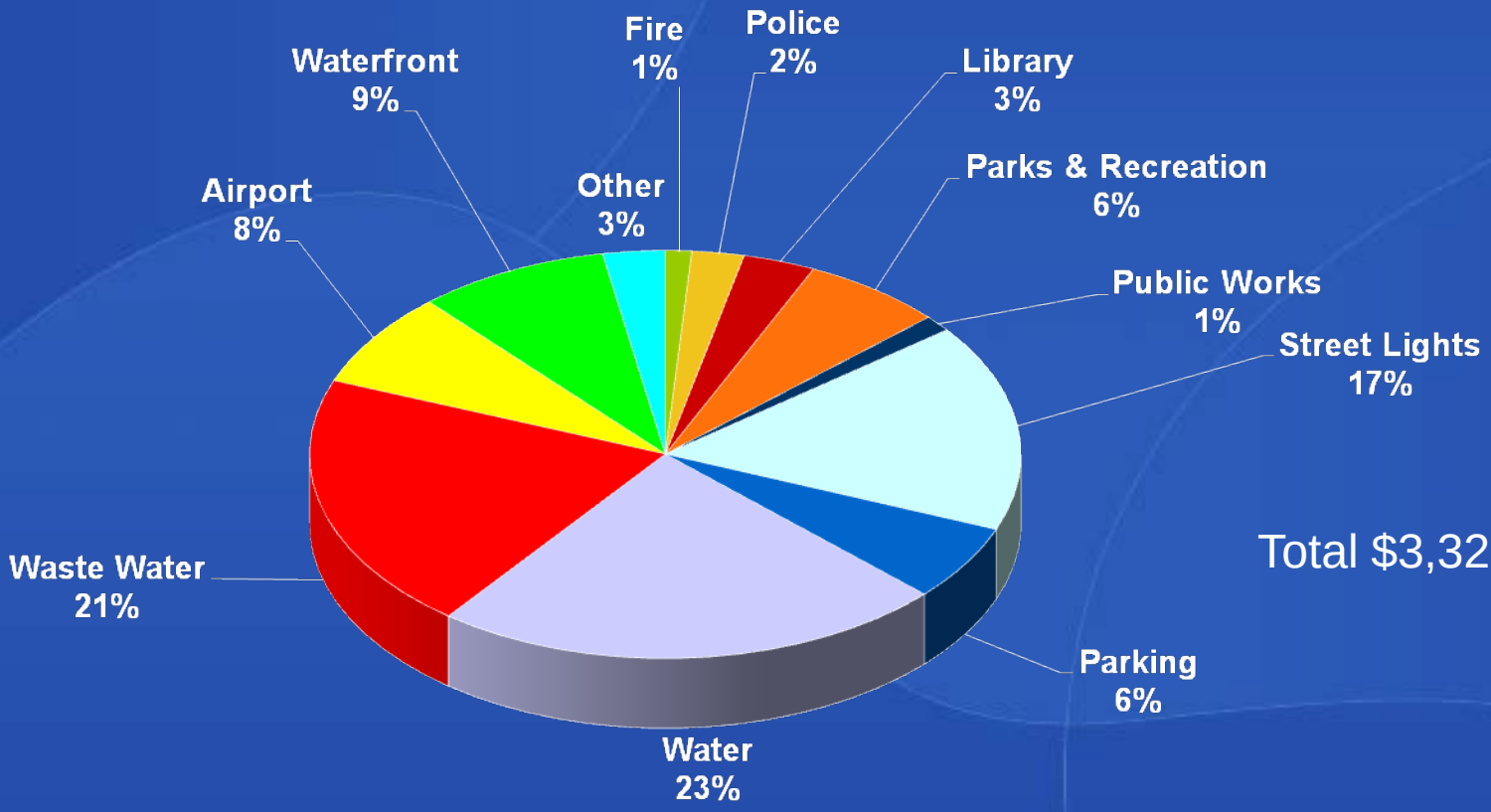
In Fiscal Year 2011 (July 2010 through June 2011) the City spent $3.3 million on electricity. 44% of electrical use was for treatment of water and wastewater at the City's treatment facilities and pumping stations. Staff is planning to improve local water quality by installing ozone water treatment at the Cater Water Treatment Plant beginning in 2012. This will be a benefit to the community by improving drinking water quality, but will significantly increase energy use by the plant. Therefore, water use reduction will result in energy savings too!

Street lighting also uses a large amount of electricity. Due to safety concerns, the demand for more neighborhood lighting is always growing and in 2011 it grew by over 10%. The City is looking to new technologies, like light emitting diodes (LEDs), to provide efficient street lighting in the future.

The following chart shows the breakdown of electrical expenses for City operations by major use area.

FY 2011 Electricity Expense

Electricity cost by percentage of total FY 2011 expenditures for City departments or major use areas



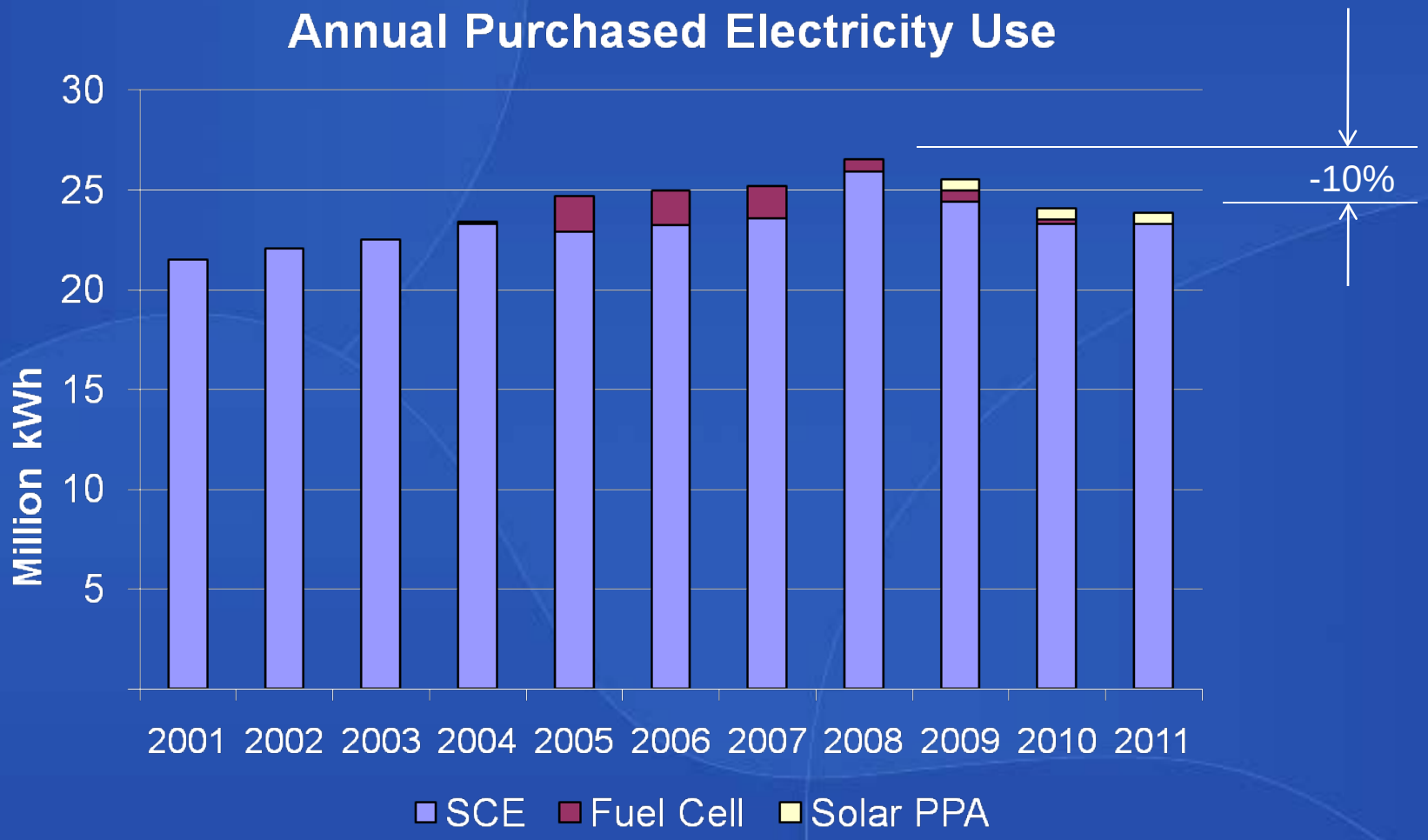
Total $3,328,400

Purchased Electricity

Since its inception, the efforts of the City's Energy Team have resulted in a 10% reduction in electricity consumption for City operations, despite unavoidable increases in demand.

The following chart shows the energy consumption for City operations over time for all sources of purchased electricity.

Purchased Electricity



Biggest Electricity Users

The following table shows the electricity use for the five largest City service accounts. Water treatment and street lighting are both large electricity users, and their energy use is growing due to demand by the community.

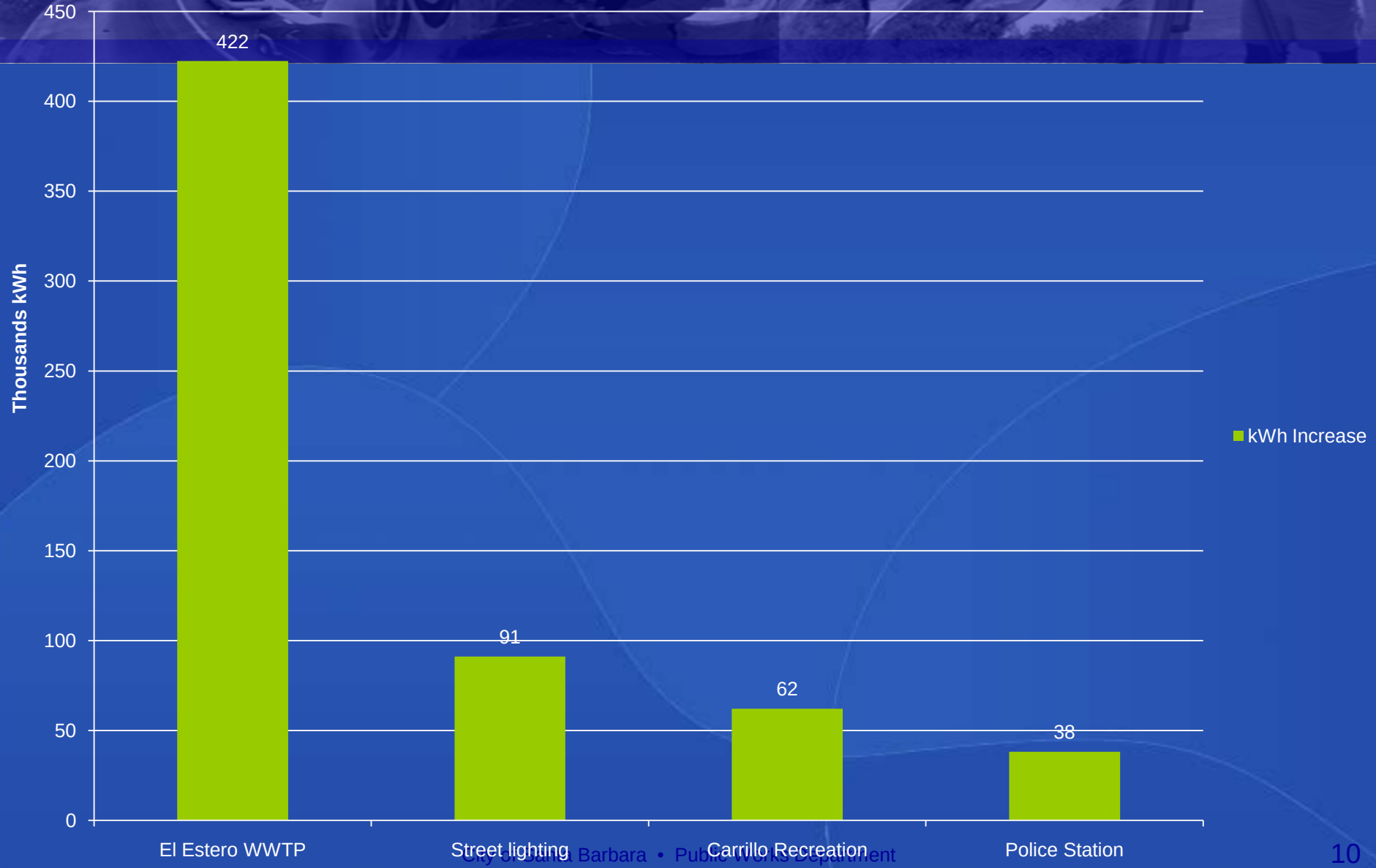
SCE Account	kWh
El Estero Wastewater Treatment Plant	6,822,720
Cater Water Treatment Plant	2,247,036
Marina 1	941,936
Ornamental Street Lighting – Downtown	850,955
Police Department	665,599

Increased Electricity Use

Several City electricity accounts have seen significant increases this year. Increases are due to increased demand for lighting (street lighting), inefficient systems (Police Department & El Estero) and increased facility use (Carrillo Recreation).

The following graph shows the four accounts most heavily affected.

Major Electricity Increases Since Last Year



Natural Gas

Natural Gas

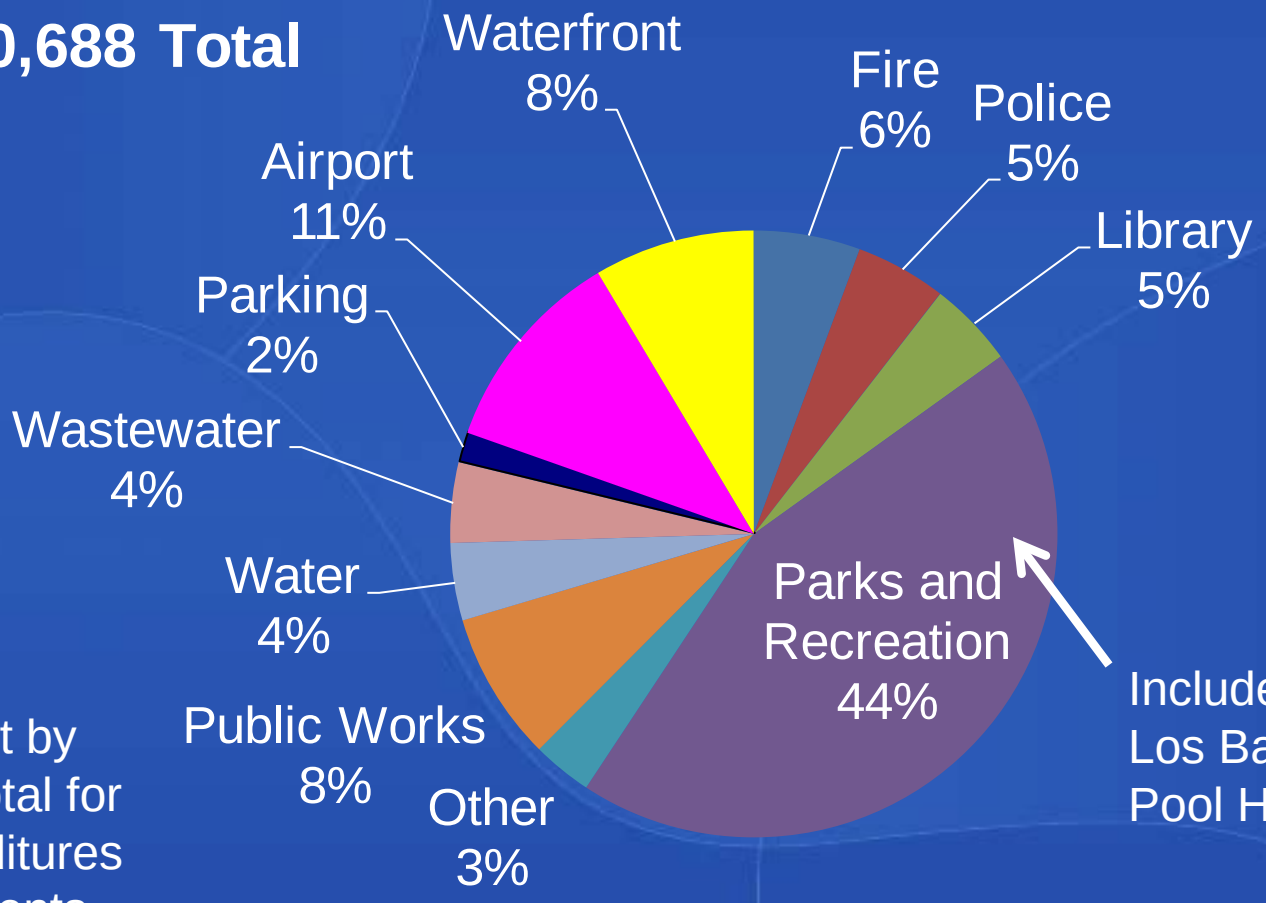
Though natural gas usage for City continues to remain relatively constant, the Energy Team is still seeking out opportunities to reduce natural gas consumption.

Pool heating at the Los Baños del Mar pool remains the largest consumer of natural gas for the City. To reduce the substantial natural gas use at the Los Baños Del Mar pool, City staff will replace the pool boilers with high efficiency condensing boilers. This is expected to result in an annual savings of $6,000.

The boiler replacement project will be funded by the Southern California Gas Company's On Bill Financing program, which will loan the City the necessary capital funds at no interest to be repaid through savings realized by the project.

FY 2011 Natural Gas Expenditures

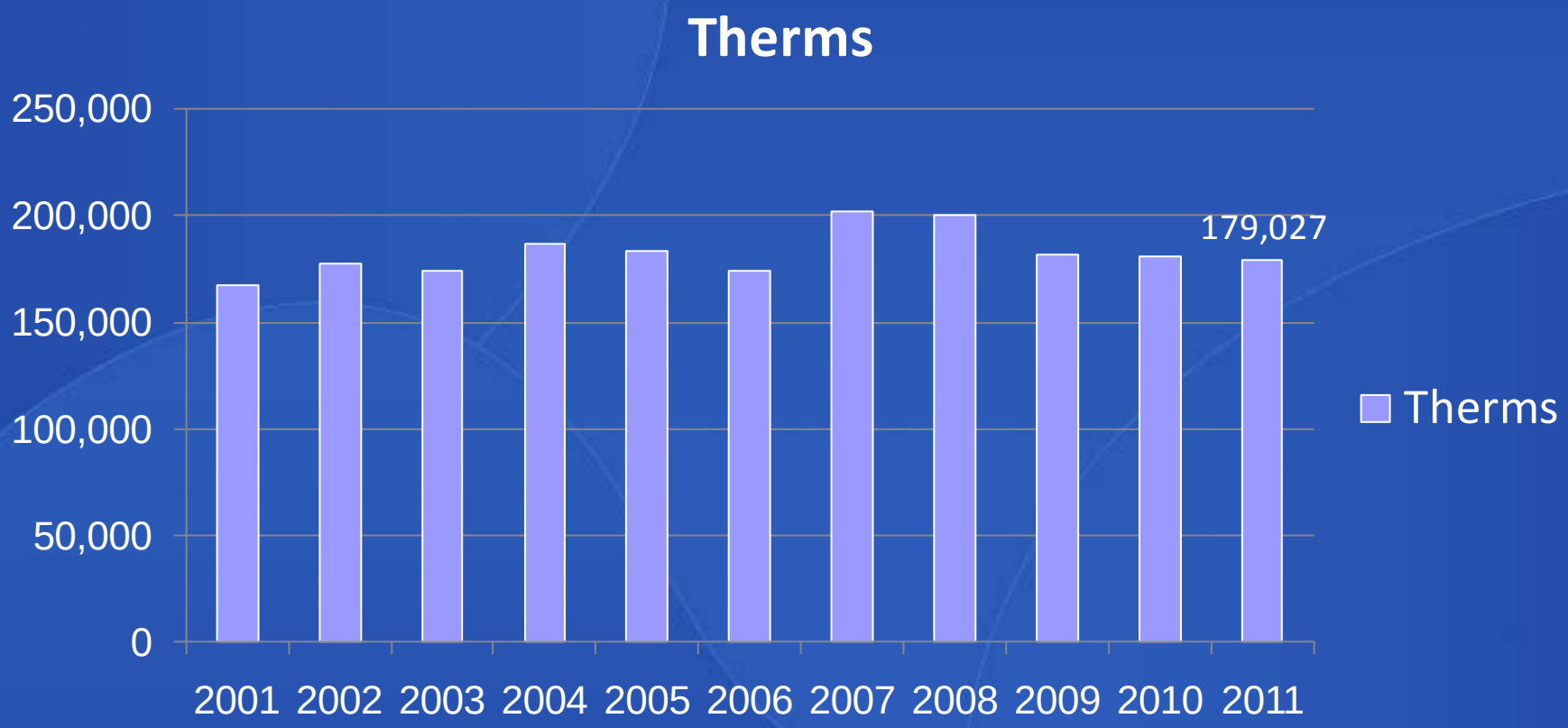
$170,688 Total



Includes the Los Baños Pool Heating

Natural Gas cost by percentage of total for FY 2010 expenditures for City departments

Natural Gas Use by Year



This chart outlines the natural gas usage for all City facilities since 2001

Largest Natural Gas Users

Account	2011 Therms
Los Baños Pool	50,273
625 Laguna (Public Works)	13,426
Police Station	13,361
Cabrillo Pavilion	10,745
El Estero Wastewater Treatment Plant	8,258

This chart shows the largest single Southern California Gas Company accounts. Facilities is planning to install new high-efficiency boilers at the Los Baños pool in FY 2012.

Los Baños del Mar Pool

This chart spotlights the usage of the City's highest natural gas user, Los Baños Pool, since 2001.

Renewable Energy

Renewable Energy

Renewable energy represents a substantial and growing part of the City‘s electricity supply. Currently, renewable energy sources make up 24% of all the City‘s electricity use.

Renewable energy sources include the City’s photovoltaic generation sources and Southern California Edison renewable sources and will soon include renewable methane cogeneration located at the El Estero Wastewater Treatment Plant.

Photovoltaic Generation

The City has two large photovoltaic (PV) generation facilities. The first—a 300 kW plant, located in the Public Works Corporate Yard was installed in December 2008, and supplies 88% of the electricity used for the Public Works facility.

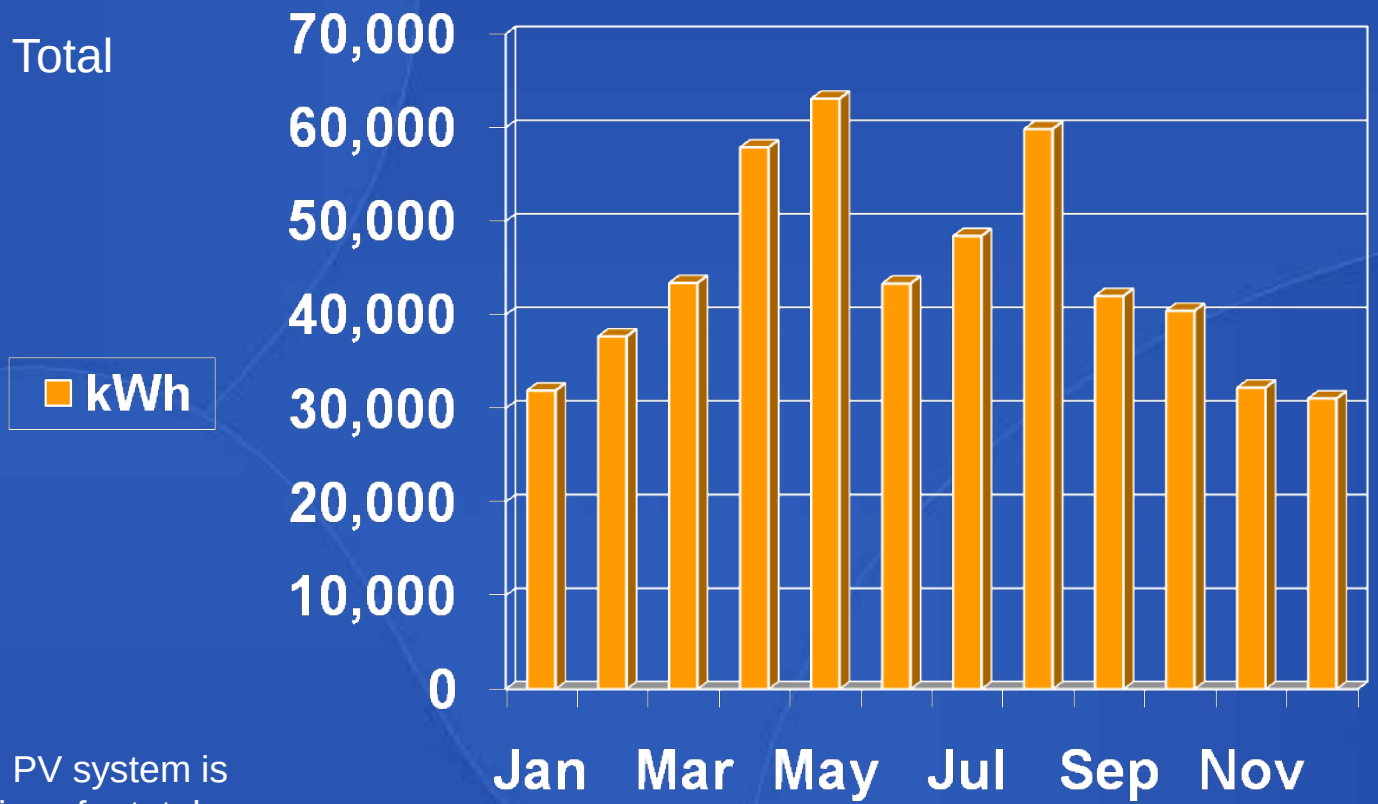
The second plant is located at the Airport‘s —Quick Turn Around rental car maintenance facility, and provides more than 100% of the facility‘s electrical needs. The excess generation is sold to Southern California Edison.

Two smaller systems provide electricity to two of the City Fire Stations.

The following charts show the monthly production (and demand for the QTA facility) for both PV facilities.

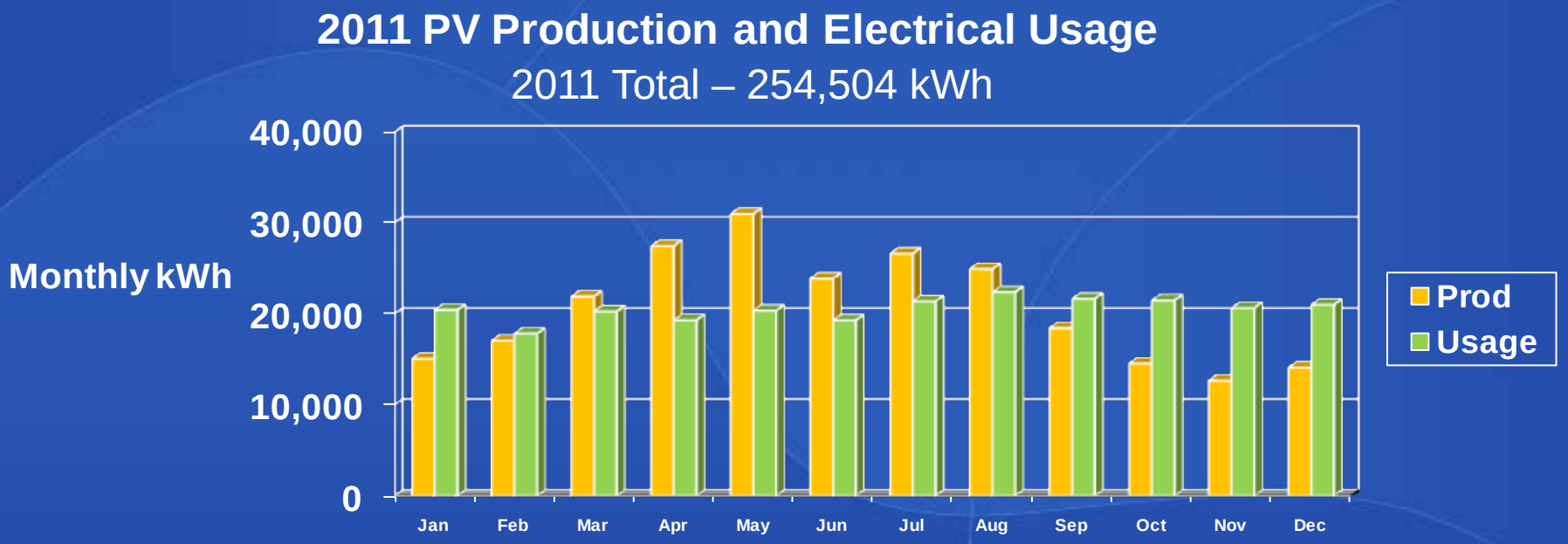
2011 Corporate Yard Power Production

531,128 kWh Total



The Corporate Yard PV system is exceeding expectations for total generation. The system provides 88% of the electrical needs for the Garden Street and Laguna Street Complexes

Airport QTA PV System



Solar Photovoltaic Projects

Project	kW (size)	Annual kWh
PW Corporate Yard PV	302	531,128
Airport QTA PV	190	254,504
Fire Station 2 PV	15	24,000
Fire Station 1 PV	10.2	24,000

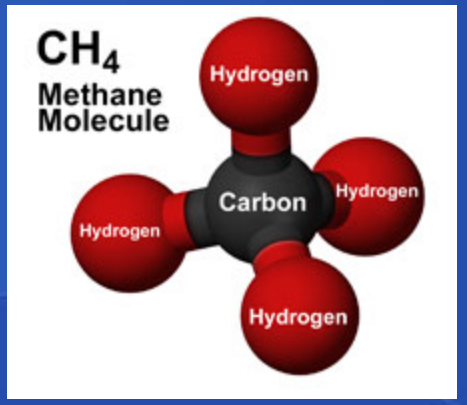
This table shows the annual solar generation and system size for all City solar photovoltaic generation projects. These systems provide a total annual generation of 840,000 kWh. This is enough energy to power 150 local area homes.

El Estero Methane Generation

The El Estero Wastewater Treatment Plant produces enough methane to generate most of the plant's electrical and heating needs. A fuel cell, installed in 2005, provided electrical generation and waste heat using methane as fuel, but was taken out in 2010 due to unreliability.

In order to harness this energy potential the energy team has been working on installing a cogeneration internal combustion engine that will convert the methane into electricity and heat.

In order to make this capital-intensive project possible, the City entered into a power purchase agreement with a third party implementer, California Power Partners (CalPwr).



I.C. Engine Generation
El Estero

Our energy provider, CalPWR, will provide all capital funding and provide a turn-key cogeneration facility which the City will purchase at a flat rate of 8.49 cents per kWh for 10 years. The City will also receive all waste heat produced by the system for free. We are currently investigating different options for applying the waste heat that will increase energy savings.

City will save an average of $60K/Year on electricity through this power purchase agreement.

2011 Renewable Electricity Totals

Southern California Edison delivers about 21.1% renewable energy in their power mix.

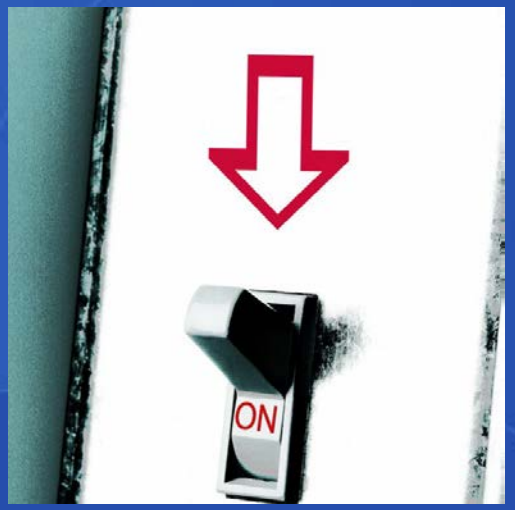
Between the renewable energy provided through SCE and the City's renewable generation sources renewable energy makes up 24% of the City's total electricity usage.

Energy Conservation

The energy team is applying new technologies, such as a comprehensive Enterprise Energy Management Information System and building automation systems to find new opportunities for reducing energy use.

When the Energy Team designs energy conservation projects, we try to maximize:

- Energy Savings
- Operational Savings
- Maintenance Savings
- Deferred Maintenance Reduction – targeting building systems that need to be replaced due to age



Energy Conservation

The City received a $868,200 Energy Efficiency and Conservation Block Grant through the American Recovery and Reinvestment Act of 2009. The City used the funds to upgrade old HVAC equipment, install new building controls, upgrade sports lighting and partially fund the City's Climate Action Plan.

These projects are projected to save 526,000 kWh and $81,000 annually and will all be completed by September 12, 2012.

Success Story: Central Library

As part of the EECBG grant, we installed a variable frequency drive (VFD) in a large multi-zone HVAC unit at the Central Library.

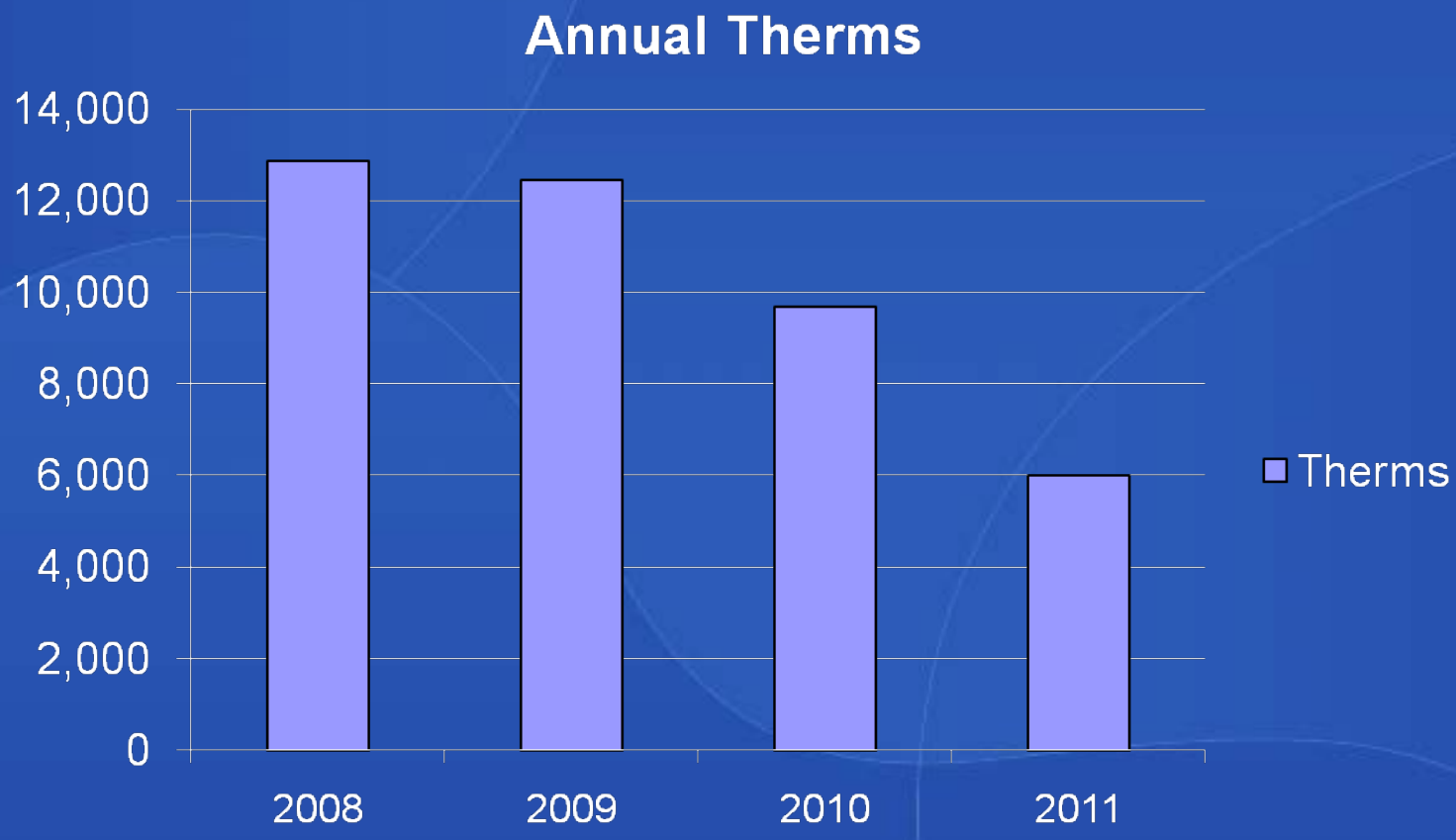
A VFD saves power by varying motor speed to accommodate the load, instead of running constantly at the highest speed necessary.

The city received a significant incentive ($6,000) from SCG due to the large number of therms saved annually.

Central Library HVAC

Central Library Gas Usage

This chart shows the annual therms usage at the Central Library since 2008



Central Library HVAC

The success of the Central Library's HVAC upgrade and VFD installation is apparent in the results, which are as follows

- 32% reduction in electricity use
- $32,000 annual energy reduction
- $6,000 annual natural gas savings
- Improved ventilation and temperature control

Success Story: Plug Load Occupancy Sensors

The City received nearly 500 plug load occupancy sensors free from SCE. These were installed on computer workstations all around the City and are projected to result in a savings of 60,000 kWh per year!

Energy Team Savings

The efforts of the Energy Team have resulted in significant cost savings for the City. Since the Team became active in 2008, we have achieved an ongoing annual savings of $350,000 from energy conservation and tariff changes.

The Team also applies for and receives grants and rebates. The following page shows the one-time grant and rebate funding and cumulative annual savings for the City‘s energy program

One Time Savings 2011

- Rebates – $ 21,037
- Grants - $ 400,000

Ongoing Annual Savings*

- Annual Conservation Savings – $ 278,040
- Annual Electrical Rate Savings – $ 120,700

Total- $ 398,740

* From actions taken 2008 through 2011

Future Energy Projects

During fiscal year 2012, The Energy Team plans to complete the rest of our Energy Efficiency and Conservation Block Grant projects, which include Sports lighting upgrades, HVAC upgrades and the installation of building automation systems.

We have also received a grant of $360,000 from Southern California Edison to implement an enterprise energy information system that will monitor the City's energy use for operations in real-time. This system will help us to plan future conservation and renewable generation projects.

We will also be completing our Fats, Oils and Grease (FOG) receiving station and our engine cogeneration facility at the El Estero Wastewater Treatment Plant. The FOG project will allow El Estero to receive —brown grease from local restaurant grease interceptors and inject that material into the waste treatment process—generating more methane to be used by the cogeneration facility to generate electricity and heat for plant operations.

Future Energy Conservation Projects

- Highlights for 2012
  - EEMIS
  - EV Charging stations
  - Dwight Murphy Lighting
  - Los Baños Boilers
  - Cogen
  - FOG

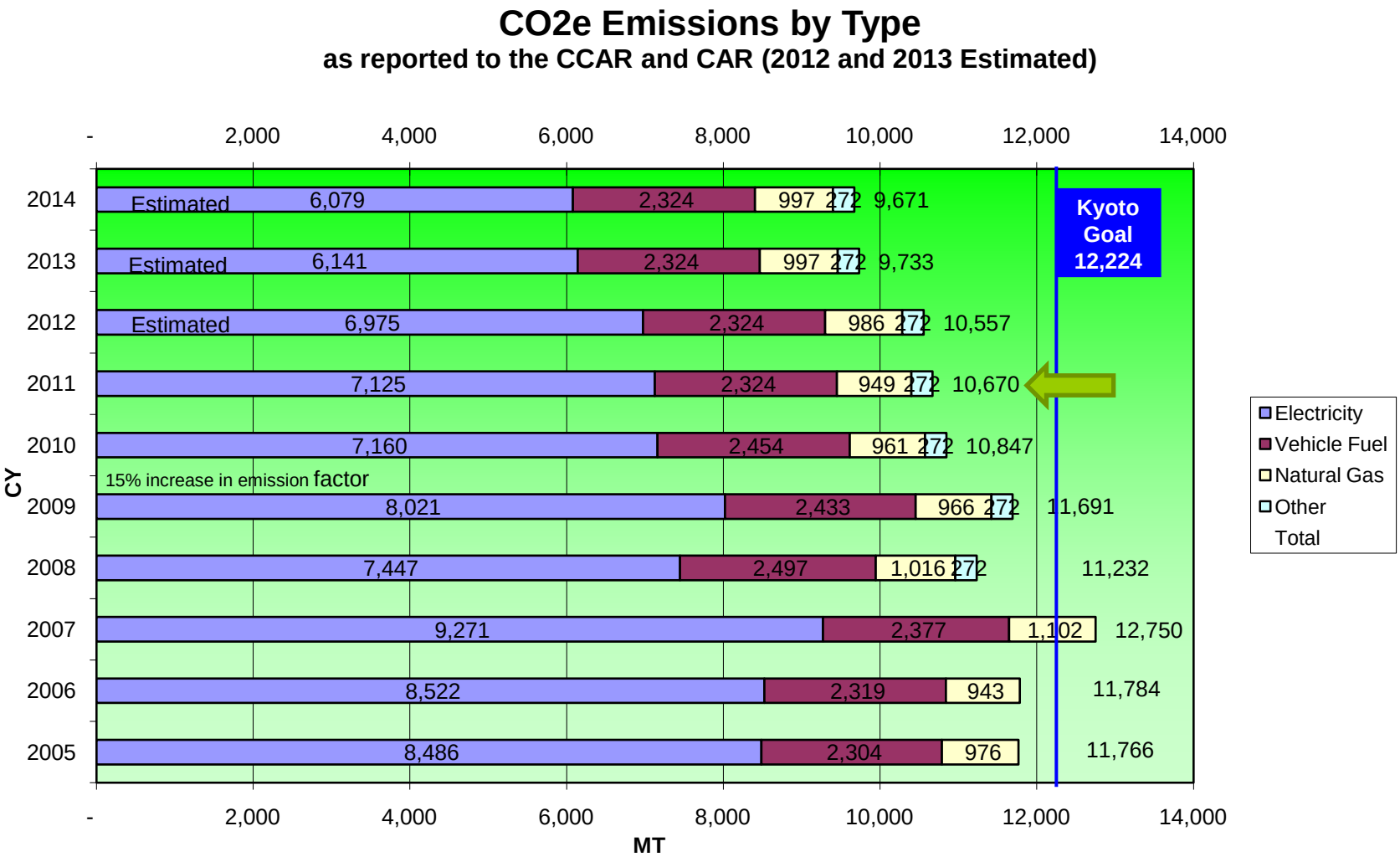
GHG Emissions

Greenhouse Gas Emissions

The City's greenhouse gas emissions for operations from all sources, including transportation, energy use and other sources; are decreasing due to conservation and efficiency. Calendar year 2011's emissions in Carbon Dioxide Equivalents (CO2e) is 10,793 metric tons, a 54MT decrease from last year and well below our Kyoto target of 12,224 metric tons.

The following chart shows actual and projected CO2e since 2005.

CO_2e Emissions from City Operations



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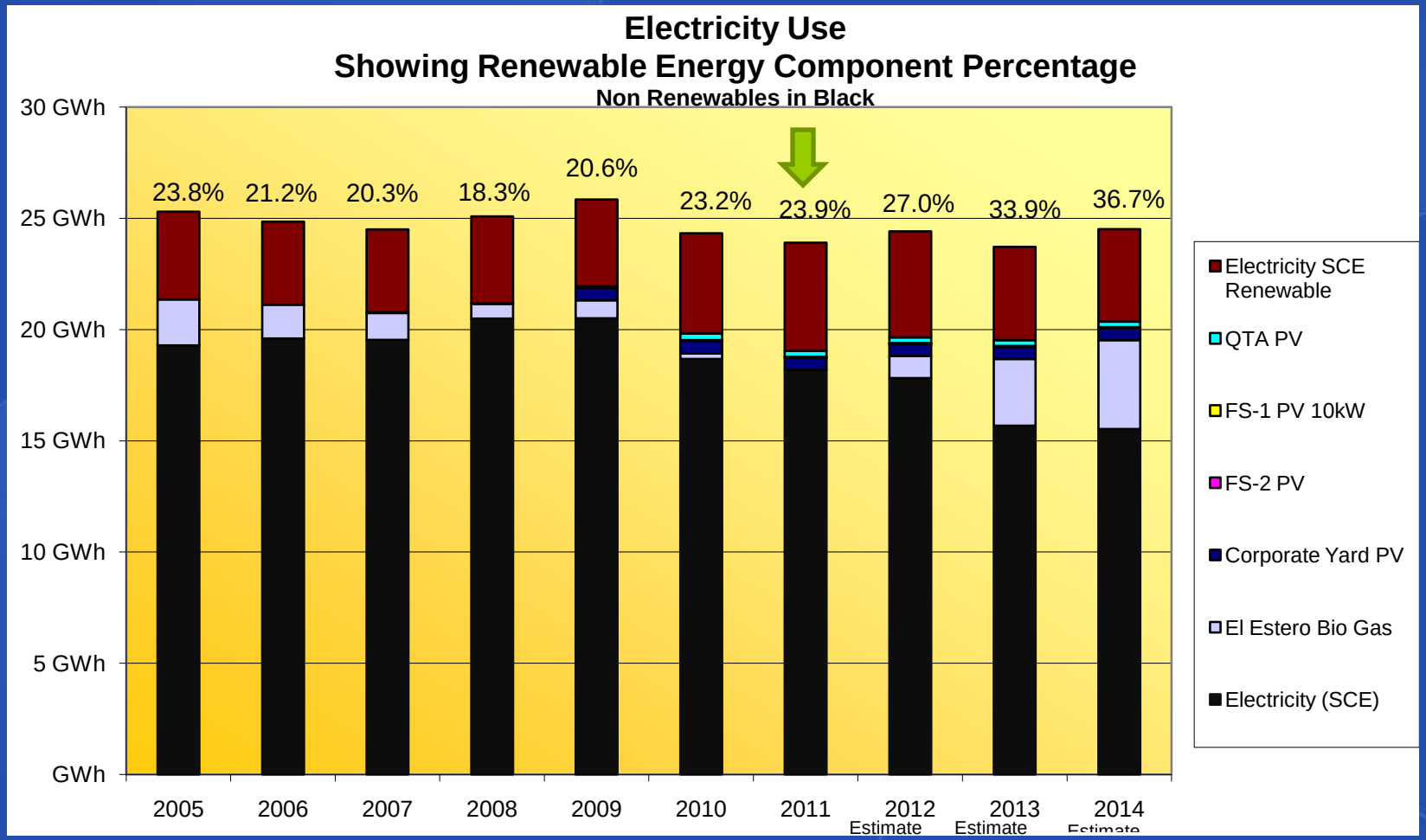
Renewable Percentage of Electricity City Operations



Acknowledgements

The Energy Team‘s success this year is the result of the hard work of City staff, and the support of the City Council and the Community. Our aim is to serve as an example by implementing projects the save energy and money, using strategies that others can duplicate.

During these difficult economic conditions, energy conservation is a great opportunity to save money and preserve natural resources.

Thanks to you for supporting our efforts to conserve energy and save money.